

IN THE CLAIMS:

Claim 1 (currently amended): A method for manufacturing a structural element comprising:

providing a first part with a surface substantially of copper and adapted to be mechanically and electrically connected to a metal surface of a second part;

depositing a hard layer on said surface of said first part, said hard layer consisting of at least one of the following materials:

- a) SiO_x with $1.5 \leq x \leq 2$;
- b) TaSiN;
- c) TiN;
- d) AlO;
- e) TiSiN;
- f) TaN;
- g) SiN;
- h) WSiN;
- i) ReO;
- j) PdO;
- k) ZrO;
- l) YO;
- m) ZrN;
- n) NbN;
- o) VN;
- p) CuN;

whereby said hard layer is amorphous under X-rays.

Claim 2 (currently amended): The method of claim 1 further comprising the steps of providing [[a]] the second part with [[a]] the surface of a metal, and connecting said first part with said second part by bonding said surface of said first part to said surface of said second part through the hard layer.

Claim 3 (original): The method of claim 1 further comprising the step of depositing said hard layer so that said hard layer is stable to at least 80° C.

Claim 4 (original): The method of claim 1 further comprising the step of depositing said hard layer so that said hard layer is stable to at least 100° C.

Claim 5 (original): The method of claim 1 further comprising the step of depositing said hard layer so that said hard layer is stable to at least 150° C.

Claim 6 (original): The method of claim 1 further comprising the step of depositing said hard layer so that said hard layer is stable to at least 200° C.

Claim 7 (original): The method of claim 1 further comprising the step of depositing said hard layer so that said hard layer is stable to at least 300° C.

Claim 8 (original): The method of claim 2 wherein said surface of said second part substantially consists of copper.

Claim 9 (original): The method of claim 2 wherein the surface of said second part consists of gold and of aluminum.

Claim 10 (original): The method of claim 1 wherein at least one of said first part or said second part is a wire.

Claim 11 (original): The method of claim 1 further comprising the step of depositing said hard layer by a vacuum deposition process.

Claim 12 (original): The method of claim 1 further comprising the step of cleaning said surface of said first part before depositing said hard layer.

Claim 13 (original): The method of claim 12 wherein said cleaning is by a treatment in a hydrogen plasma or in a nitrogen/hydrogen plasma.

Claim 14 (original): The method of claim 1 further comprising depositing said hard layer with a thickness of at least 1.5 nm.

Claim 15 (original): The method of claim 14 further comprising depositing said hard layer with a thickness of at least 2 nm.

Claim 16 (original): The method of claim 1 further comprising the step of depositing said layer with a thickness d which is in the range of $2.0 \text{ nm} \leq d \leq 10 \text{ nm}$.

Claim 17 (original): The method of claim 1, wherein said material of said hard layer comprises oxygen in a substoichiometric ratio.

Claim 18 (original): The method of claim 1, wherein said step of depositing said hard layer comprises depositing a layer and treating said layer deposited in at least one of a nitrogen plasma and in ambient atmosphere.

Claim 19 (original): The method of claim 1, wherein said material comprises SiO_2 .

Claim 20 (original): The method of claim 1, wherein said hard layer consists of SiO_x and is deposited by sputtering.

Claim 21 (original): The method of claim 20 further comprising the step of depositing said Si by sputtering.

Claim 22 (original): The method of claim 1 wherein depositing said hard layer comprises depositing a layer of Si and treating said layer of Si by a thermal treatment in ambient atmosphere.

Claim 23 (original): The method of claim 1, wherein said depositing comprises depositing a metallic layer and oxidizing said metallic layer.

Claim 24 (original): The method of claim 23 further comprising the step of oxidizing by at least one of the following parameters:

thickness of the layer;

temperature during oxidizing; and

the atmosphere wherein said oxidizing is performed.

Claim 25 (currently amended): The method of claim 1, wherein said material comprises $[(Ta_xSi_yN_z)] Ta_xSi_yN_z$ and wherein x is in the range $35 \leq x \leq 55$; y is in the range $12 \leq y \leq 18$; and z is in the range $32 \leq z \leq 48$ with $x + y + z = 100$.

Claim 26 (original): The method of claim 1, wherein said material comprises $Ta_{45}Si_{15}N_{40}$.

Claim 27 (original): The method of claim 1, wherein said material comprises Si_3N_4 .

Claim 28 (original): The method of claim 1 further comprising depositing said hard layer as an electrically insulating layer.

Claim 29 (original): The method of claim 1 further comprising the step of depositing said hard layer as an electrically conductive layer.

Claim 30 (original): The method of claim 1 further comprising the step of selecting said hard layer to be of one of said materials.

Claim 31 (original): The method of claim 1 wherein said layer is a functional layer of a function of said element.